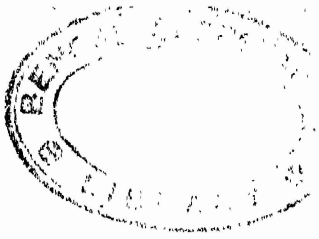

ANNUAL REPORT OF THE ROYAL BOTANIC GARDEN, CALCUTTA, FOR THE YEAR 1883-84.

No. 21G, dated Seebpore, the 19th April 1884.

From—GEORGE KING, ESQ., M.D., Superintendent, Royal Botanic Garden, Calcutta.
To—The Secretary to the Government of Bengal, Financial Department.

I HAVE the honour herewith to submit the ninety-seventh annual report of the Royal Botanical Garden.

ANNUAL REPORT OF THE ROYAL BOTANIC GARDEN, CALCUTTA, FOR THE YEAR 1883-84.

IN my last annual report I announced the completion of the scheme of garden improvements which I originally submitted to Government in 1874, and I there stated that little more remained to be done in the way of original work in order to put the garden into an efficient condition. I have therefore no extensive improvements to give an account of as having been carried out during the year that has just ended. Some minor changes that suggested themselves have been made, and new works carried out during the past few years have had finishing touches put to them, which, although apparent enough to the eye, are not easily described in writing. In addition to these, the new palm-house, the erection of which had been completed within the previous year, was last year planted out. For this purpose plants which had outgrown the limits of the former low-roofed conservatories were carefully transplanted during the rains. This work was successfully carried out by the Curator, Mr. Urquhart, and the percentage of deaths was very small. The interspaces between the larger plants were filled up by lower growing species of various kinds—*aroids*, *marantas*, *selaginellas*, and the like—which had been in preparation in the nurseries for months in advance. The result has been gratifying, and the new palm-house is already much admired by visitors. And as the plants continue to grow, the general effect in the interior of the house will greatly improve. The engine for pumping water from the river was at work during the greater part of the cold season, and I am glad to say it proved a great success. The different pieces of ornamental water in the garden having been connected by underground pipes, it is now possible by means of the pump to keep these all over the garden at a uniform and high level. This greatly increases the landscape effects, and cannot but conduce to the healthiness of the garden, which, as Government is aware, had acquired in by-gone years the reputation of being a very feverish place. For a good many years past the banks of the river within the garden boundary have been in a very rugged condition, not from scouring by the stream, but from the erosion caused by the wash of steamers passing at a rapid pace. And this erosion had been carried so far that in some places the garden road running parallel to the river had begun to be threatened. During the past year I made an attempt, with the sanction and approval of Government, to mend the bank, and, selecting 800 feet of one of the worst pieces, I decided to fill it up with mud dug from the bed of the river at low tide, to put a good slope on it and to face it with cheap refuse bricks from Agra. This work has been very carefully carried out by Mr. Urquhart, the Curator of the garden, and I hope that by this cheap and simple means the further encroachments of the river may be prevented. And if this piece of work succeeds, I hope I may be allowed to treat the remaining pieces of eroded bank in a similar fashion during the current and succeeding years. The boundary wall along the western limit of the garden has been completed during the year, the bricks used having been burnt in the garden. The northern boundary is the only one that now remains to be protected by a wall, and this may, I hope, be built within the next year or two.

2. The distance and inaccessibility of the garden from Calcutta have long been matters of regret. A means of neutralising these has presented itself during the year by the establishment on the river of a service of passenger steamers which call at several points within the port, something after fashion of the penny steamers on the Thames. One of the calling places of these steamers is Mattiabruj ghat, just opposite the garden; and it appears to me that it would be a convenience for visitors to the garden were these steamers to call at a point on this side of the river and just outside the garden. Public parks and gardens, such as this, are universally recognized as powerful agencies for refining and civilising the masses of the people, and as a most efficient means of putting a pure and elevating kind of pleasure within their reach. In this view the erection of a landing stage so that these steamers might be induced to call at or near the garden might not be considered an inappropriate object to spend a little money on.

3. *Economic Plants.*—During the year several economic plants have received attention. Consignments of *sabai* grass (*Andropogon involutus* of Stendel and *Pollinia eriopoda* of Hance) have been received from various parties proving its extensive distribution in quantity in various parts of the province. There is now no doubt of the suitability of this grass as a paper fibre, provided it can be laid down cheaply enough at a mill. This grass unfortunately affects districts where water carriage does not exist, and for cheap raw material (such as that for paper must necessarily be) any other kind of carriage is apt to fall as a crushing and prohibitive tax. Some months ago I cut some branches of a paper mulberry tree (*Broussonetia papyrifera*) two years old, and had the bark removed. The latter was reported on by a paper-maker and pronounced, as I expected, an admirable paper material. Experience in this garden has already proved that this tree grows easily and rapidly in Lower Bengal, and I am assured by Mr. Maries, Superintendent of the Gardens of His Highness the Maharajah of Durbhunga, that it also grows well at Durbhunga—a much drier part of the province. If therefore villagers would take to growing this tree by the borders of their gardens and in the *odd* corners and scraps of ground in which Bengal abounds, there is a reasonable prospect that the province might produce in quantity one of the very best paper fibres known—a fibre at once strong and fine, and that has the great merit of requiring very little bleach. With the view of extending the cultivation of this tree, I am having thousands of young plants prepared for issue and for planting out in blank spots along the garden boundary. A further consignment of the plant yielding the cassia bark of commerce was received from the Botanic Garden, Hong-Kong. These plants are of course quite young. They are, however, quite healthy. The plant seems a slow grower, and some time must elapse before anything can be gathered as to the likelihood of its being grown to a profit in Bengal as a source of Cassia bark. As stated in my last report, a quantity of seed of the Soy bean was distributed to tea-planters and others likely to interest themselves in its cultivation. This bean had been much written about as a pulse well suited for India, and its cultivation had been pressed on Government. I never had much hope of its success, as I do not consider it a crop well suited for the climate of any part of Bengal, and the reports that have been received from planters to whom supplies of seed were sent have been unfavourable. During the year quantities of green Rhea were supplied to various applicants. Other fibrous plants were also supplied to gentlemen interesting themselves in such matters.

4. *Gourami Fish.*—Through the kindness of the Hon'ble H. S. Thomas, one of the garden tanks was stocked with a quantity of the young of this excellent fish, and in my last report I expressed a hope that this fish would thrive in the sheets of ornamental water in the garden. I regret to say that the experiment has been a failure, for when the tank into which the young Gourami had been put was dragged two months ago, not a single Gourami could be found. I propose, however, to make another trial.

5. *Herbarium.*—When the year began, the collections of dried plants and the library had just been removed into the new building provided for their reception. Owing to the cramped and utterly insufficient accommodation afforded by the old building, it had been impossible to incorporate in the named herbarium the large quantities of new material that had been received during the previous few years. The work of arranging, naming, and incorporating

these is a long and laborious one. But Mr. Brace has worked diligently at it, and good progress has been made. A great deal, however, still remains to be done. The library also has received a good deal of attention, and a beginning has been made in classifying the large number of botanical pamphlets which it contains. The new building proves, on further experience, to be admirably adapted for its purpose. It is light, dry, and well ventilated, and in it there is room to consult the collections with ease and comfort, while at the same time they are well secured against damp, insects, and fire. During the year the herbarium has been enriched by large sets of duplicate specimens received from the herbarium of the Royal Garden at Kew. The distinguished director of that great national institution, Sir J. D. Hooker, has always been a warm friend to the Calcutta garden, and the herbarium here owes to a great extent its existence to his thoughtful munificence. His contributions of last year are therefore only a continuation of former favours. Considerable collections made in the Malayan Peninsula by Mr. H. H. Kunstler were also received during the year. Among these are specimens of many plants yielding important economic products, such as gutta-percha, caoutchouc, building timber, and the like. The flora of the Malayan Peninsula closely resembles that of the lower part of Burmah, and these Malayan collections are of much value and interest from the bearing they have on the flora of the still comparatively unexplored regions near Tavoy and Mergui. To Mr. J. Sykes Gamble, lately Conservator of Forests in Bengal, but now occupying a similar appointment in the Madras Presidency, the herbarium is indebted for a large number of most interesting specimens from the south of India. As the flora of that part of the country was hitherto rather poorly represented in our collection, Mr. Gamble's contribution was peculiarly acceptable. The same remark applies to the less numerous but very interesting collections sent by Mr. W. A. Talbot, Deputy Conservator of Forests in North Canara. Dr. Schlich, Inspector-General of Forests, has also sent some valuable collections made during his recent tours in the Central Provinces and the Himalaya beyond Simla. Mr. J. F. Duthie, Superintendent of the Botanical Garden at Saharanpur (who spent some weeks working in the herbarium), contributed a very interesting collection (containing several novelties) made by him in some side valleys in the upper part of the course of the Ganges which had hitherto never been explored by a botanist. Dr. Trimen, Director of the Botanical Garden in Ceylon, who also visited the garden during the past year, presented a few critical species of much botanical interest. Prior to leaving India, Mr. H. C. Levinge deposited in the herbarium a large series of ferns collected by himself in the south of India and the Himalaya. These specimens, named by Mr. Levinge's own hand, have a peculiar value and interest, as probably no botanist ever had a more extensive knowledge of Indian ferns than Mr. Levinge. Dried specimens of some critical plants of Mahableshwar were contributed by Dr. T. Cooke, Principal of the Science College, Poona. Mr. Ford, Superintendent of the Botanic Garden, Hongkong, Mr. R. W. Hullett, of the educacational service of the Straits Settlements, and Mr. Maries of Durbhunga have also sent acceptable contributions; as also have Mr. C. B. Clarke, of the Educational Department, Mr. Woodrow, of the Government Garden at Poona, Mr. Hildebrand, Deputy Commissioner of Arakan, and Dr. Hay of Aden.

6. *Interchange of plants and seeds.*—During the year 23,809 living plants and 3,716 packets of seeds were issued to various public officers for planting round jails and other public buildings, along stations and cantonment roads, near dispensaries, schools, and so forth. A considerable number of plants were also supplied to the International Exhibition recently held in Calcutta. Wardian cases, to the number of fifty-eight, were sent to botanic and other gardens in various parts of Europe and the Colonies. On the other hand, living plants to the number of 9,179 and packets of seeds to the number of 1,038 were received from various donors in India and out of it. The chief contributors were Sir J. D. Hooker, of the Royal Garden, Kew; the Directors of the Botanic Gardens in Ceylon, Demerara, Natal, Hong-Kong, and Java; Messrs. Haage and Schmidt, Erfurt, and Messrs. Bull and Veitch, London; Mr. E. H. Man, of the Andaman Commission; the Agri-Horticultural Societies at Rangoon, Lucknow, Calcutta; Messrs. P. Hordern and Barton Groves, Rangoon; Mr. Duthie, of the Botanic Garden, Saharanpur; the Superintendents of the

Government gardens at Poona, Bangalore, and Lucknow; Mr Cassels, of Bombay, and various officers of the Indian Forest Department. As usual, Messrs. Apcar & Co. generously carried plants and seeds to and from the Malayan countries free of freight; the Peninsular and Oriental and British India Steam Navigation Companies also carried gratuitously cases passing between this garden and those at Kew and Peradeniya.

7. The herbarium has throughout the year been under the charge of its Curator, Mr. L. J. K. Brace, to whose unflagging exertions its greatly improved condition is largely due. Mr. G. Urquhart, who was appointed acting Curator of the garden in the early part of the year, has worked well and has been confirmed in his appointment as Curator. Towards the close of the year, Mr. Halfdan Bahr, the new Assistant Curator selected by Sir J. D. Hooker from the Kew staff, joined his appointment here. Mr. Bahr is at present making himself familiar with the vernacular language, and has already begun to take an active part in the working of the garden.

8. The receipts from the sale of surplus plants during the year were Rs. 1,345-11-9, which sum was paid into the treasury. The budget allotment for the year amounted to Rs. 70,350 and was all disbursed.

9. *Lloyd Botanic Garden, Darjeeling*.—I regret to say that this garden still suffers, although in a modified degree, from the ravages of the cockchaffer grub, of which I gave an account in former reports. Mr. Jaffrey, the Curator of the garden, made during the previous year the most strenuous efforts to collect these grubs, and this seems to be the only effectual way of dealing with them. In spite, however, of all Mr. Jaffrey's efforts, a good many of the smaller grubs or of eggs must have survived; and as soon as the weather began to get warm, these showed signs of activity. All hands were at once set to collect them, and a few coolies were kept at this work during the whole of the last hot weather and rains. It is to be hoped that this pest may not shew itself again this year. Should it, however, show itself, I think it might be desirable to suspend all distribution of living plants from the garden, as grubs or their eggs are often concealed in the soil contained in flower pots. Specimens of the grub and of the beetle into which it developes were sent long ago, through Dr. J. Anderson of the Indian Museum, to a specialist in London for identification and report. But as yet no answer has been received from the specialist. I am therefore still unable to give the name of the creature. A similar grub has proved very destructive in Ceylon to coffee planted in patana or grass land; but I trust the Darjeeling grub will discover no partiality for tea. The unsatisfactory condition of the sanatarium hill above the garden still remains a cause of anxiety, and the fall of an avalanche of semi-liquid mud from the heaps of *debris* lying just above the garden is an occurrence of which during every rainy weather Mr. Jaffrey lives in daily dread. The municipality have at last, I am glad to say, done something towards improving the drainage of their land which bounds the garden on two sides The acclimatised potatoes, raised from English seed imported some years ago, continue to keep up a high quality: these potatoes are now freely distribution over the district. The budget allotment of the year for this garden was Rs. 8,480 and the whole of it was spent. The receipts for sale of plants, amounting to Rs. 502-11-0, were paid into the Darjeeling Treasury as Government revenue.

10. The usual annual returns, four in number, are appended.

APPENDIX I.

Statement showing plants received from 1st April 1883 to 31st March 1884.

From whom received.	Wardian cases.	Boxes.	Number of plants.
Royal Garden, Kew, London	2	.....	60
Do. Botanic Garden, Ceylon	2	.....	59
Botanic Garden, George Town, Demerara	2	.....	55
Ditto, Natal	.....	4	215
Ditto, Hong-Kong	2	.....	152
Ditto, Batavia	1	1	67
Ditto, Gunesh-Khind, Poona	.....	2	51
Lloyd Botanic Garden, Darjeeling	.....	5	1,106
Agri-Horticultural Society, Calcutta	.....	.....	24
Ditto ditto, Rangoon	.....	4	314
Campagnie Continentale d' Horticulture, Gand	2	.....	58
Messrs. Haage and Schmidt, Erfurt	.....	1	1,000
J. Gammie, Esq., Government Cinchona Plantation, Mungpoo	.....	1	6
Dr. E. Sanders, Chittagong	.....	1	1
W. Bull, Esq., Nurseryman, London	1	.....	71
H. Hamilton, Esq., Singapore	.....	1	29
G. H. Bartlett, Esq., Calcutta	.....	.....	3
R. B. West, Esq., ditto	.....	.....	36
C. Maries, Esq., Durbhunga Raj Garden	.....	.....	107
M. Ridley, Esq., Horticultural Gardens, Lucknow ...	.....	1	100
J. A. Cassels, Esq, Bombay	1	.....	11
J. Barton Groves, Esq., and P. Hordern, Esq., Rangoon ...	.....	5	143
Lieutenant-Colonel R. F. Angelo, Nynee Tal	.....	1	2
Colonel T. Cadell, C.B., Andamans	.....	1	68
E. H. Man, Esq., ditto	1	16	373
Dr. J. Reid, ditto	2	1	105
J. H. J. Schaumberg, Esq., Calcutta	.....	.....	2
Messrs. Schoene, Kilburn and Co., Calcutta	.....	3	202
C. B. Clarke, Esq., Calcutta	.....	1	6
T. Cooke, Esq., Mahableshwar	.....	4	15
J. D. Maxwell, Esq., Calcutta	.....	1	7
C. Morris, Esq., Pachmarhi	.....	1	11
G. Baistul, Esq., Calcutta	.....	.....	4
R. Wallnut, Esq., Mymensingh	.....	1	3
Dr. A. J. Payne, Calcutta	.....	.....	2
„ J. G. Pilcher, Howrah	.....	.....	15
Captain Peter, Ship *Duchess of Edinburgh*	.....	2	224
H. O. Levinge, Esq., Sikkim	.....	.....	22
Messrs. Turner, Morrison and Co., Calcutta	.....	6	75
S. Kilby, Esq., Calcutta	.....	.....	3
Collected by the Superintendent in Sikkim	.....	.....	100
Ditto by Herr Kunstler, Penang	19	21	1,922
Ditto by Moonshee Abdulla, Plant Collector, Andamans ...	1	3	1,967
Ditto ditto ditto Assam	.....	1	12
Ditto ditto ditto Khasia Hills	.....	1	37
Babu S. P. Chatterjee, Victoria Nursery, Calcutta ...	.....	.....	15
Horee Mally, Nurseryman, Manicktollah, Calcutta ...	.....	.....	3
Bought at auction	.....	.....	16
Received from an unknown donor	.....	.....	1
Ditto ditto	.....	2	97
Total ...	36	92	8,977

APPENDIX II.

Statement showing plants sent out from 1st April 1883 to 31st March 1884.

To whom sent.	Wardian cases.	Boxes.	Number of plants.
Government House Garden, Calcutta	.....	1	141
Royal Garden, Kew, London	.....	2	38
Do. Botanic Garden, Ceylon	5	1	303
Botanic Garden, George Town, Demerara	3	1	122
Ditto, Natal	.....	9	285
Ditto, Hong-Kong	.....	1	24
Ditto, Vienna	1	.....	30
Ditto, Trieste	1	.....	29
Jardin des Plantes, Saigon	2	.....	56
Deputy Commissioner, Sonthal Pergunnahs	.....	10	164
Ditto, Arrakan Hill Tracts	2	1	54
Ditto, Daltonganj	.....	8	204
Agri-Horticultural Society, Calcutta	.....	.....	81
Ditto ditto, Rangoon	.....	9	117
V. and A. Museum, Bombay	.....	.....	18
Horticultural Gardens, Lucknow	.....	12	118
Superintendent of Agriculture, Ajmere	.....	1	12
Ditto ditto and Forests, Cooch Behar ...	.....	2	19
Right Hon'ble Earl of Northbrook, England	.....	1	58
The Hon'ble Sir Ashley Eden, London	.....	1	72
Rev. Frederick Pretyman	.....	1	125
Colonel Frederick Stanton	.....	1	104
Sir George McLeay, England	.....	1	15
J. Sims, Esq., Victoria	1	.....	29
J. Thomson, Esq., Victoria	7	.....	114
H. Hardy, Esq, Sussex	.....	1	117
Magistrate and Chairman, District Road Cess Committee, Khulna	.....	1	12
Magistrate and Chairman of Motiharee	.....	13	366
Cantonment Magistrate, Dum-Dum	.....	.....	150
Ditto ditto, Dinapore	.....	2	50
Commissary of Ordnance, Calcutta	.....	.....	2,567
J. G. Parish, Esq., Hastings	.....	.....	100
Conductor J. C. Newell	.....	.....	100
General Wilkinson, Fort William	.....	.....	30
The Chaplain, Fort William	.....	.....	12
Executive Engineer, Northern Drainage and Embankment Division, Calcutta	.....	3	32
Executive Engineer, Akra	.....	.....	280
Ditto, Burdwan Division, Chinsurah ...	.....	1	315
District Engineer, Mymensingh	.....	1	13
Ditto, East Indian Railway, Howrah ...	.....	.....	300
Secretary to the Municipal Committee, Bareilly	.....	2	12
Cathedral Day School, Calcutta	.....	.....	200
Church Mission Society	.....	.....	101
Catholic Male Orphanage	.....	.....	400
Public Library, Seebpore	.....	.....	80
Engineering College, ditto	.....	.....	2
Superintendent, Government Workshop, Seebpore ...	.....	.....	14
Principal, Government Engineering College, ditto ...	.....	.....	50
Calcutta Municipality	.....	.....	250
Rajputana-Malwa Railway, Mhow	.....	8	195
Calcutta and South-Eastern and Nalhati State Railways ...	.....	46	1,500
Bengal Central Railway Company, Limited	.....	.....	150
Superintendent, Gunpowder Factory, Ishapore	.....	.....	275
Ditto, Jails, Pubna	.....	6	150
Ditto, do., Ranchi	.....	4	100
Ditto, do., Buxar Circle	.....	4	110
Ditto, Central Jail, Midnapore	.....	7	260
Ditto, ditto, Rajshahye	.....	6	248
Traffic Superintendent, Saidpore	.....	5	130
Collector of Kistna	.....	1	20
Ditto Hooghly	.....	5	100

APPENDIX II—*continued.*

To whom sent.	Wardian cases.	Boxes.	Number of plants.
Collector of Purneah	.....	4	91
Superintendent Public Garden, Allahabad	.....	5	58
Ditto, Rambagh Garden, Amritsar	.....	12	127
Ditto, Durbhunga Raj Garden	.....	21	455
Acting Port Officer, Calcutta	.....	3	150
Executive Commissariat Officer, Calcutta	.....	.....	100
Transport Officer, Calcutta	.....	.....	200
His Highness the Sultan of Zanzibar	2	.....	87
Lieutenant-Colonel R. F. Angelo, Nynee Tal	.....	5	108
A. A. Apcar, Esq., Calcutta	.....	.....	33
A. T. Apcar, Esq., Seebpore	.....	.....	50
S. T. Apcar, Esq., Garden Reach	.....	.....	33
F. J. Atkinson, Esq., Calcutta	.....	.....	98
S. Antony, Esq., ditto	.....	.....	2
G. E. Anderson, Esq., Calcutta	.....	.....	60
Dr. T. Beaumont, M.D., Hyderabad	.....	1	12
M. Bertin, Marseilles	1	.....	31
H. Blandford, Esq., Calcutta	.....	.....	8
Hon'ble J. Bosisto, M.P., Melbourne	1	.....	24
H. Bryans, Esq., Sylhet	.....	4	74
J. Bailie, Esq., ,, ...	.....	22	250
Dr. R. A. Barker, M.D., Doomka	.....	2	24
G. Bartlett, Esq., Calcutta	.....	.....	17
R. Blechynden, Esq., ,, ...	.....	.....	50
W. R. Blackett, Esq., ,, ...	.....	.....	150
Mrs. D. Bruce, London	1	.....	34
Dr. E. Bonavia, M.D., Etawah	.....	1	6
Dr. G. Bidie, C.I.E., Madras	1	.....	28
Messrs. Burn & Co., Howrah	.....	.....	20
A. W. Cooper, Esq., Dum-Dum	.....	.....	40
Mr. Clark, The Gardens, Studley-Ripon	.....	1	62
J. A. Cassels, Esq., Bombay	1	1	60
D. Edubzi, Esq , Calcutta	1	.....	32
D. Esburgh, Esq.	.....	.....	4
Max. H. Ferars, Esq., Andamans	1	.....	27
Lieutenant-Colonel T. Cadell, V.C.	1	.....	24
Messrs. Finlay, Muir & Co., Calcutta...	2	5	153
R. A. Fairlie, Esq., ,, ...	...	.....	22
M. Gutteling, Esq., ,, ...	2	.....	86
J. H. Gilliland, Esq., Engineering College, Seebpore ..	.....	.....	26
Captain Grew, Ship *Celia*	.....	.....	7
J. H. Gilbert, Esq., Rangoon	...	1	15
Major H. C. Houghton, Madras	.....	.....	24
W. B. Hutchinson, Esq., Calcutta	.....	.....	100
J. Hodding, Esq., ,, ...	.....	7	154
J. Inglis, Esq., Sydney	3	.....	78
Rev. Father Joseph, Calcutta	.....	.....	190
J. Johnston, Esq., ,, ...	.....	.....	20
R. Jackson, Esq., ,, ...	.....	.....	1
R. Knight, Esq., ,, ...	.....	.....	8
R. Ken, Esq., ,, ...	.....	.....	6
S. Kilby, Esq., ,, ...	.....	.....	54
H. H. Kunstler, Esq., Penang	1	.....	28
Captain Lincken, Ship *L. L. Sturge*	.....	.....	4
Dr. A. S. Lethbridge, Calcutta	.....	.....	23
J. L. Lister, Esq., Phoolbarri	.....	6	64
E. Lacey, Esq., Howrah	.....	.....	8
A. H. Mason, Esq., Seebpore College...	.....	1	63
E. H. Man, Esq., Andamans	2	.....	88
G. Mann, Esq., Shillong	.....	3	29
G. G. Le Messurier, Esq., Darjeeling	.....	4	40
Dr. Mackenzie, Sealdah	.....	.....	52
Captain McMahon, S. S. *Clan Sinclair*	1	.....	34

APPENDIX II—*continued.*

To whom sent.	Wardian cases.	Boxes.	Number of plants.
G. Mills, Esq., Seebpore	.....	.....	350
E. F. Mondy, Esq., do.	.....	.....	40
Rev. P. Mollick, Calcutta	.....	.....	1
E. N. Minchin, Esq., do.	.....	.....	4
Messrs Mackinnon, Mackenzie & Co., Calcutta	.....	.....	14
Colonel Nicholl, Garden Reach	.....	1	17
V. Nepos, Esq , Calcutta	.....	.....	4
Dr. J. G Pilcher, Howrah	.....	.....	16
Captain R. Peebles, S. S. *Tweedale*	.....	.....	5
Dr H. B. Purves, Burdwan	.....	3	65
Dr. A. J. Payne, Calcutta	.....	1	9
W. C. Plowden, Esq., London	1	.....	24
E. H. Palmer, Esq., Chandbally	.....	3	73
R. Pantling, Esq., Mungpoo	.....	2	53
J. Parkes, Esq., Siliguri	.....	2	23
Rev. A. W. R. Quinlan, Dum-Dum	.....	3	130
F. A. deRoepstorff, Esq., Nicobar Islands	1	.....	30
Dr. J. Reid, Andamans	1	6	105
T. J. Rowell, Esq , M D., Singapore	1	.....	25
Captain Robertson, Ship *Lorenzo*	1	.....	18
T. H. Ralli, Esq., Calcutta	.....	.....	12
A. Simson, Esq., do.	.....	.....	58
A. E. W. Sharpe, Esq., Howrah	.....	.....	9
Messrs. Schoene, Kilburn & Co., Calcutta	.....	1	12
J. H. J. Schaumberg, Esq., do.	.....	.....	8
Dr. Stewart, do.	.....	.....	5
W. Swetenham, Esq., Selangore	4	.....	102
W. Swinhoe, Esq., Calcutta	.....	.....	20
Mrs. Sedgefield, do.	.....	.....	5
R. Sterndale, Esq., do.	.....	.....	60
A. Stewart, Esq , do.	.....	.....	5
G. R. Thom, Esq., do.	.....	.....	200
Hon'ble H S. Thomas, Madras	.....	1	9
Captain Jas. Vincent, Ship *Myramoy*	.....	.....	34
Dr. G. Watt, for International Exhibition	.....	1	4,551
Superintendent of Works, for ditto	.....	.....	2,000
R. B. West, Esq , Manager, Horticultural Company, Calcutta	.....	.....	92
Captain S. F. Walker, Perak	6	.....	153
A. E. Penching, Esq., Pundular	.....	2	4 maunds of Rheea root, 1 maund of Rheea stems.
J. Kenyon & Co., Calcutta	.....	.....	
Revenue and Agricultural Department, Calcutta	.....	.....	17 maund of Rhee stems.
Kumar Jainarain Singh, Meerut	.....	1	6
Seth Luchman Doss, Calcutta	.....	1	8
Juggul Kissen, Benares	.....	1	12
Sakharam Gopal, Indore	.....	.....	2
Babu S. P. Chatterjee, Victoria Nursery, Calcutta ...	.....	.....	138
„ S. P. Chowdhury, Krisnagore	.....	.....	3
„ N. C. Mookerjee, Calcutta	.....	.....	12
„ B. B. Gangooly, Howrah	.....	.....	11
„ B. N. Ghose, Seebpore	.....	.....	4
„ B. K. Dey, Ooterparah	.....	.....	3
„ B K. Dey, Calcutta	.....	.....	3
„ D. N. Bose, ditto	.....	.....	2
„ M. N. Roy, Moorshedabad	.....	1	1
„ D. P. Ghose, Calcutta	.....	.....	1
„ G D. Koondu, Maibari	.....	.....	2
„ H. P. Bhuttacharjya, Nuddea	.....	.....	2
„ K. C. Nag, Seebpore	.....	.....	2
„ K. B. Mullick, Andool	.....	.....	5
„ R. N. Seth, Calcutta	.....	.....	7
„ R. M. Doss, Rungpore	.....	.....	14
„ W. J. Kurmoker, Calcutta	.....	.....	6

APPENDIX II—*concluded.*

To whom sent.	Wardian cases.	Boxes.	Number of plants.
Babu A. K. Dutta, Balee	.....	.....	₹ 1
,, Rameshwar Malleah, Howrah	.....	.....	16
Sreenath Mally, Nurseryman, Manicktollah	.....	.....	37
Horee ditto, ditto, ditto, ...	.....	.....	25
Gopal ditto, ditto, ditto, ...	.....	.....	2
Issan ditto, ditto, ditto, ...	.....	.....	14
Total ..	58	318	23,809

APPENDIX III.

Statement of seeds received from 1st April 1883 to 31st March 1884.

From whom received.	Number of parcels or packets.
Sir J. D. Hooker, K.C.S.I., Director, Royal Garden, Kew, London	6
Dr. Regel, Imperial Garden, St. Petersburg, Russia ...	154
Botanic Garden, Trinidad, West Indies	12
Ditto Hobart Town, Tasmania	45
Ditto Mauritius	5
Ditto Jamaica	19
Ditto Buitenzorg, Java	1
Ditto Hong-Kong, China	5
Ditto Peradeniya, Ceylon	5
Ditto Bangalore	1
Ditto Gunesh-khind, Poona	35
Ditto Saharanpur	16
Ditto Darjeeling	194
Sir Ferdinand von Muller, F.R.S., Melbourne, Australia ...	24
Directeur, Societe Anonyme de la Horticulture, Gand, Belgium	2
Agri-Horticultural Society, Madras	1
Secretary, Agri-Horticultural Garden, Lucknow	3
Ditto ditto of India, Calcutta ...	4
Hon'ble J. Bosisto, M.P., Melbourne, Australia	49
Messrs. G. Brunning & Son, St. Kilda Nurseries, Melbourne ...	10
James F. Roberts, Esq., F.H.S., Melbourne	81
Messrs. James Veitch & Sons, Royal Exotic Nursery, Chelsea, London	24
Hon'ble J. Thurston, Secretary to the Government, Fiji Islands ..	1
Conservator of Forests, Tenasserim Circle, Maulmain ...	1
Deputy Conservator of Forests, in charge Cinchona Department, Ootacamund	1
Conservator of Forests, Nagpur	1
Deputy Conservator of Forests, Gowhati, Assam	1
E. H. Man, Esq., Port Blair, Andamans	155
Abdoolah, Plant Collector, Port Blair, Andamans	10
W. J. Talbot, Esq., Forest Department, North Canara ...	4
J. Inglis, Esq., New South Wales	21
Messrs. Thomas Christy & Co., 155 Fenchurch St., London ...	2
Unknown donor	3
Messrs Haage and Schmidt, Erfurt	5
James Francis Esq., Cedar Valley, Jamaica	1
Messrs. E. P. William and Brothers, Heneratgoda, Ceylon ...	5
J. Maitland Heriot, Esq., Manila	1
Messrs. Barr and Sugden, Covent Garden, W. C.	119
J. Cassels, Esq., Bombay	1
Curator, Government Central Museum, Madras	1
Mrs. Morris, Pachmarhi	1
Dr. George King, Darjeeling	2
J. Gammie, Esq., Government Cinchona Plantation, Mungpoo ...	2
J. M. Cunningham, Esq., M.D., Surgeon-General	3
Rai Prosunna Coomar Banerjee Bahadoor, Eden Garden, Calcutta	1
Total ...	1,038

APPENDIX IV.

Statement showing Seeds distributed from the Royal Botanical Garden during the year 1883-84.

To whom sent.	Number of parcels and packets.
Sir J. D. Hooker, K.C.S.I., C.B, F.R.S., &c., Royal Garden, Kew, London	96
Dr. Regel, Imperial Garden, St. Petersburg, Russia	44
Botanic Garden, Queensland, Australia	5
Ditto Leiden, Holland	129
Ditto Utrecht, Holland	130
Ditto Buitenzorg, Java	3
Ditto Hong-kong, China	106
Ditto Mauritius	10
Ditto Golden Spring, Jamaica	185
Ditto George Town, Demerara	5
Ditto Peradenia, Ceylon	14
Ditto Singapore	5
Ditto Bangalore	1
Ditto Saharanpur	145
Ditto Darjeeling	258
Directeur, Societe Anonyme de la Horticulture, Gand, Belgium ...	35
Secretary to the Queensland Acclimatization Society, Queensland	5
Ditto Agri-Horticultural Society, Madras ...	3
Ditto ditto Lahore ...	13
Superintendent, Horticultural Garden, Lucknow	19
Secretary to the Agri-Horticultural Society of India, Calcutta ...	23
Secretary to the Government of Cyprus, Cyprus	4
Sir John Kirk, M.D., C.M.G., &c., Her Britannic Majesty's Consul-General, Zanzibar	109
M. Bertin, France	123
M. Emile Chabrand, Barcelonette, France	1
Senores Chabrand and Manuel, Mexico	1
M. Buysman, Esq., Flushing, Holland	124
Mrs. Hutcheon, Lasswade, Scotland	1
Messrs. Thomas Mosley & Co., Gibraltar	72
W. G. Head, Esq., Crystal Palace, London	5
Sir George Macleay, F.R.S., &c., Pendell Court, Bletchingley, Surrey	44
Sir A. J. Arbuthnot, Newton House, Newbury, England ...	64
Dr. J. Campbell Brown, University, Liverpool	1
Messrs. G. Brunning & Son, St. Kilda Nurseries, Melbourne ...	5
G. J. Sims, Esq., Barford, Brighton, Victoria, Australia ...	1
William Bull, Esq., King's Road, Chelsea, London	6
Messrs. James Veitch & Son, King's Road, Chelsea, London ...	5
Messrs. Haage & Schmidt, Erfurt, Prussia	49
W. S. Swetenham, Esq., British Resident, Selangore, Straits Settlements	1
C. C. Bancroft, Esq., Vice-Consul General, United States of America, Calcutta	28
Conservator of Forests, Bengal	1
Assistant Conservator of Forests, Ajmere...	9
Ditto Cooch Behar Division, Cachar ...	2
Deputy Conservator of Forests, Kurseong	3
Ditto Lohardugga, Ranchee ...	1
Ditto Alipur Duar	1
Dr. Bidie, Superintendent, Central Museum, Madras... ...	2
Chairman, District Road-cess Committee, Patna	3
District Traffic Superintendent, Rajputana-Malwa Railway, Ajmere	870
Thomas Barnard, Esq., Locomotive Department, East Indian Railway, Buxar	24
Superintendent of Chumparun Jail, Chumparun	12
Mrs. C. Blake, Buggah, Chumparun	1
Hon'ble J. Bosisto, M.P., to International Exhibition ...	21
Hon'ble C. P. Ilbert, Simla	44
Lieutenant-Colonel C. Cowie, Commissary of Ordnance, Calcutta	1
Ditto C. R. Smith, Resident, Udaipore	16
A. H. Hildebrand, Esq., Deputy Commissioner, Arakan ...	6
M. R. Weld, Esq., South Arcot, Madras Presidency	10
Captain Parrott, Settlement Officer, British Burma	2

APPENDIX IV—*continued.*

From whom received.	Number of parcels and packets.
Under-Secretary to the Government of Bengal, Public Works Department, Calcutta	1
S. Watson, Esq., Calcutta	1
Inspector-General of Jails, Calcutta	1
Assistant Secretary to the Government of Bengal, Calcutta ...	7
H. C. Wilkinson, Esq., Calcutta	27
W. H. Cogswell, Esq., Ditto	1
Messrs. Williamson, Magor & Co., Calcutta	2
Angelo Falciai, Calcutta	12
Colonel Young, Ditto	1
C. Fouracres, Esq., Seebpore Engineering College, Seebpore ...	63
The Director, Agricultural and Commercial Department, North-Western Provinces and Oudh	1
C. Maries, Esq., Raj Durbhunga, Behar	3
E. H. Man, Esq., Port Blair, Andamans	27
James Inglis, Esq., Sydney, Australia	2
Major H. B. Abbott, Political Superintendent, Jhalarapatan ...	1
Major A. C. Talbot, Political Agent, Bikanir	102
Major-General Sir H. T. Macpherson, K.C.B., K.C.S.I., &c., Allahabad	40
George Takeda, Esq., Japan	2
J. Gammie, Esq., Government Cinchona Plantation, Mungpoo ...	14
Manager, Nuxulbarree Tea Association, Nutalbarree, Darjeeling ...	2
Ditto, Singtom Tea Company Limited, Darjeeling ...	2
Ditto, Happy Valley Tea Estate, Darjeeling	2
Ditto, Chamong Tea Estate, Nagri Spur, Darjeeling ...	2
Ditto, Lebong Tea Company, Limited, Tukvar, Darjeeling ...	2
Ditto, Mim Tea Company, Limited ditto ...	2
Ditto, Tukvar Company, Limited ditto ...	2
Ditto, Dooteriah Tea Estate, ditto ...	2
Ditto, Darjeeling Tea Company, Limited, Ging, ditto ...	2
Ditto, Lebong and Mincha Tea Estates, ditto ...	2
Ditto, Darjeeling Tea and Cinchona Association, Poomong, Darjeeling	
Ditto, Land Mortgage Bank of India, Limited, Hope Town, Darjeeling	2
Ditto, Longview Tea Company, Darjeeling	2
Ditto, Nimbong Plantation, Kalimpong, Darjeeling ...	3
Ditto, Puttabong and North Point Tea Estates, Darjeeling ...	2
Ditto, Soom Tea Company, Limited, ditto ...	2
Ditto, Teesta Valley Tea Company, Limited, ditto ...	2
Ditto, Steintal Estate, ditto ...	2
Ditto, Darjeeling Company, Limited, ditto ...	2
Ditto, Ringtong Tea Estate, Sonada, ditto ...	2
Ditto, Teendaria Company, Limited, Tendharia, ditto ...	2
Ditto, Tumsong Tea Estate, ditto ...	2
Ditto, Lingim Tea Estate, ditto ...	2
Ditto, Simring Estate, Kurseong	2
Ditto, James Association, Kurseong	2
Ditto, Kurseong Tea Estate, Kurseong	2
Ditto, Castleton Estate, Kurseong	2
Ditto, Mullootar Tea Estate, ditto	2
Ditto, Selim Tea Association, ditto	2
Ditto, Spring Side Tea Company, ditto	3
Ditto, Ranicherra, Western Dooars, Dam-Dim, Julpaiguri	2
Ditto, Dooars Tea Company, Limited, Ramshai Hat, ditto	2
Ditto, Guzledubah Tea Estate, ditto	2
Ditto, Phoolbary Tea Estate, Pillans Haut, ditto	2
Ditto, Kurranata Tea Estate, Kurranti, ditto	2
Ditto, Tea Estate, Rupni, Western Dooars, Dam-Dim, ditto	2
Ditto, Tondoo Tea Company, Limited, Ramshai Hat, ditto	2
Ditto, Pullharjhora Tea Association, Dam-Dim, ditto	2
Superintendent, Dam-Dim Tea Company, Limited, ditto	2
Managing Proprietor, Nagrakata Tea Estate, Ramshai Hat, ditto	2
Manager, Terai Tea Association, Siliguri	2
Ditto, Darjeeling Terai Tea Company, Limited, Siliguri ...	2
Managing Proprietor, Mesra Tea Company, Ranchi, Chota Nagpore	1

APPENDIX IV—*concluded.*

From whom received.	Number of parcels and packets.
H. S. Beadon, Esq., Offg. Collector, Balasore	3
D. Mackenzie Smeaton, Esq., M A., B.C.S., Director of Agriculture, Rangoon...	2
Harold Hall, Esq., Pulliampetta, Vythery, Wynaad, Madras ...	1
Captain G. M. Bellasis, Executive Engineer, Jhansi	47
J. Reuther, Esq., Moorshedabad	8
District Engineer, Rungpore	1
R. C. Sanderson, Esq., Tanjore, Mudigeri Taluk, Mysore ...	1
Agricultural Reporter, Government Farm, Saidapet	1
R. C. Perry, Esq., Magistrate and Collector, Purneah ...	1
H. E. Gamy, Esq., Silchar	2
A. P. Webb, Esq., Landholder, Barout, Meerut	1
F. R. Swain, Esq., Civil Surgeon, Ranchee	1
Rev. James Wilson, Chaplain, Midnapore	1
G. Toynbee, Esq., Offg. Collector of Purneah	4
Dr. Purves, Dacca	1
J. Cameron, Esq., Lal Bagh, Bangalore	1
G. W. Jameson, Esq., Sakesar Hill, Salt Range, Shahpore ...	1
Assistant District Superintendent of Police, Kohima ...	22
G. S. Silly, Esq., Baragundah	21
M. de Sabran, Bombay	44
W. P. Aastin, Esq., Kistna, Madras	1
Seth Lutchmon Dass, Muttra, N. W. P.	50
Kumar Joinarain Sing, Didwary, Muradnagar ...	9
Babu Bonomally Koondoo, Burdwan	125
„ Chunder Nath Chowdoory, Vice-Chairman, Bauleah ...	2
„ Takhoor Dass Banerjee, Overseer, Caloutta	54
„ Gooroodas Koondoo, Andul	9
Total ...	3,716

A. E. deS.—Reg. 559J—816—25-4-84.

FINANCIAL DEPARTMENT.

AGRICULTURE.

DARJEELING, THE 9TH MAY 1884.

RESOLUTION.

READ—

The Annual Report on the Royal Botanic Gardens, Calcutta, for the year 1883-84.

The completion of the general scheme for improvements last year left little to be done in the way of original work. The planting out of the palm-house, the erection of which had been completed during the previous year, was the most noticeable work carried out in the Garden during 1883-84. For this purpose, plants that had outgrown the limits of the former low-roofed conservatories were transplanted, while the interspaces between the larger plants were filled in by lower-growing species of various kinds—*aroids*, *marantas*, *selaginellas*, and the like. The palm-house already presents a handsome appearance, and the general effect of it will be greatly enhanced as the plants continue to grow. The steam-pump, which was lately erected to keep the river water in the Garden tanks at a high level throughout the year, has proved a success. These ornamental lakes, besides improving the appearance of the Garden, have also conduced to its healthiness.

2. The distance and inaccessibility of the Garden from Calcutta greatly impair its value as a health and pleasure resort. A service of passenger steamers has recently been established, which call at several points within the port, one of the calling places being the Mattiabruj ghât, opposite the Garden. Dr. King has suggested that, if a landing-stage were erected by Government on the Howrah side of the river, at some place close to the Garden, the steamers might be induced to call there, and thereby render it much more accessible to the public. The Lieutenant-Governor would be glad to see this done if it does not involve a large expenditure. A communication on the subject will be addressed to the Agents of the Steamer Service.

3. The economic plants which engaged the Superintendent's attention during the year were the *Sabai* grass, the paper mulberry (*Broussonetia papyrifera*), the *Cinnamon* plant yielding the *Cassia* bark of commerce, and the Soy bean. The *Sabai* grass was extensively distributed in various parts of the Province, and its suitability as a paper fibre has been established beyond doubt. The bark of the paper mulberry, which has an easy and rapid growth, was reported on by a paper-manufacturer, and pronounced to be "an admirable paper material." Dr. King believes that the plant is capable of producing one of the very best paper fibres known—a fibre at once strong and fine, and requiring very little bleach. Experience has shown that the plant grows as well in the drier climate of Durbhunga as in the lower parts of Bengal; and with a view of extending the cultivation of the tree, Dr. King is having a large number of plants prepared for issue and for planting out in vacant spots along the Garden boundary. A further consignment of the *Cinnamon* plant was received from Hong-Kong during the year. The plants, though healthy, are quite young; and as they seem to grow slowly, it will be some time before their suitability to the soil of Bengal can be ascertained. The Soy bean, of which Dr. King had arranged for a supply from Japan, was distributed during the year among planters and others for experimental cultivation. The result, as was anticipated, has been a failure.

4. The experiment of utilizing the ornamental lakes in the Garden as a breeding ground for Gourami fish has also proved a failure. One of these lakes was stocked with a quantity of this fish, which had been supplied by the Hon'ble H. S. Thomas of the Madras Civil Service; but on the lake being dragged some months after, not a single fish could be found. The Superintendent, however, proposes to make a further trial.

5. Owing to the insufficient accommodation afforded by the old herbarium, it had not been possible to arrange and name a large collection of dried plants received during the past few years; but since the completion of the

new building, this work has made considerable progress under Mr. Brace's supervision. A beginning was also made in classifying the large number of botanical pamphlets which the Garden library contains. Very valuable contributions were received in the herbarium during the year from the Royal Garden at Kew, and from Government officers and other gentlemen both in India and other countries. Among the chief contributors were Mr. Kunstler, Mr. Gamble, Mr. Talbot, Dr. Schlich, Mr. Duthie, Dr. Trimen, Mr. Levinge, Mr. Ford, Dr. Cooke, Mr. Hallett, Mr. Maries, Mr. Clarke, Mr. Woodrow, Mr. Hildebrand and Dr. Hay. The interchange of seeds and plants went on actively during the year. Twenty-three thousand eight hundred and nine living plants and 3,716 packets of seeds were distributed, the principal recipients being, as usual, Station Committees, Cantonment Magistrates, and Superintendents of Hospitals and Jails. A considerable number of plants was also sent to the International Exhibition in Calcutta. On the other hand, 9,179 plants and 1,038 packets of seeds were presented to the Garden by various contributors. The receipts from the sale of surplus plants amounted to Rs. 1,345-11-9, while the whole of the budget allotment of Rs. 70,350 was spent.

6. For the third year in succession, the Lloyd Botanical Garden at Darjeeling suffered from the ravages of the cockchaffer grub. Specimens of this grub and of the beetle into which it develops have been sent to a specialist in London for identification and report, but no answer has yet been received. Dr. King's proposal to suspend all distribution of living plants from the Garden, in case the grub shows itself again this year, commends itself to the Lieutenant-Governor. A similar grub, it is stated, has proved very destructive in Ceylon to coffee planted in *patana* or grass land. Fortunately the Darjeeling grub has not as yet displayed any partiality for tea.

7. The Lieutenant-Governor desires to acknowledge the excellent work done by Dr. King and his subordinates during the past year.

ORDER—Ordered that a copy of the Report and of the Resolution be forwarded to the Government of India, in the Revenue and Agricultural Department, for information.

Ordered also that a copy of the Resolution be forwarded to the Superintendent of the Botanical Gardens for information.

By order of the Lieutenant-Governor of Bengal,

E. N. BAKER,

Offg. Secretary to the Government of Bengal.

No. 757T—F.

COPY forwarded to the Superintendent of the Botanical Gardens, Calcutta, for information.

No. 758T—F.

COPY of paragraph 2 of Dr. King's Report, and of paragraph 2 of the Resolution, forwarded to the Public Works Department. If Messrs. Hoare, Miller and Company are willing to accede to Dr. King's suggestion, enquiry should be made as to the site of the landing-place, and an estimate prepared of its cost.

By order of the Lieutenant-Governor of Bengal,

E. N. BAKER,

Offg. Secretary to the Government of Bengal.

DARJEELING,
The 9th May 1884.

C E. G.—Reg. No. 1498C—249—15-5-84.